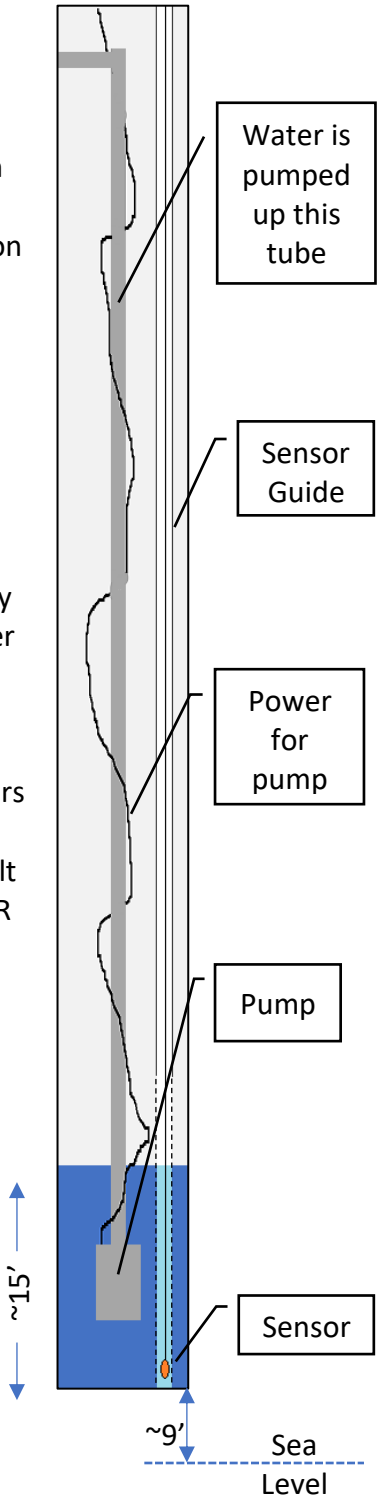
The HYDRANT

CAPE SAN JUAN WATER DISTRICT
September 2022
Newsletter No. 141

Science at the Wells

Ever since the wells were dug for the Cape San Juan Water District, there have been discussions regarding "how much water can we pump from the wells before they get contaminated with seawater?" This question arises because the water level in our 2 primary wells was thought to be approximately at or below sea level, so we were relying on a continuous flow of water down from Mt. Finlayson to keep the seawater back. If we were to ever consistently pump water faster than it is replenished, we would be in danger of seawater infiltration which would effectively condemn our wells. This would be a disaster requiring us to replace the wells with a reverse osmosis plant to treat seawater (like our neighbors at Cattle Point Estates) and your water bill would go up by a factor of 10 (at least).

Until recently, the only prudent way to manage this risk was to encourage customers to use as little water as possible and create a fee structure that penalizes heavy users. Now, however, there are sensors available to actively monitor how much salt is in our wells, both while pumping and when idle. The sensor is called a CTD-DIVER (CTD stands for Conductivity, Temperature and Depth) and looks like this:



We have already used it to determine the overall depth of water in Well #2 (15 feet), and that the water at the bottom of the well is about 50% saltier than at the top. We also determined that the water level in the well is about 20' higher than previously thought. While this is good news for all of us, we still don't know the size of our water resource. The sensor is now sitting 2 feet above the bottom of the well storing readings every 15 minutes to see if:

- The depth of water in the wells drops as water is pumped
- The depth of water in the wells varies with the tides and seasons
- The salinity of the water changes with how much water is pumped
- The salinity of the water being pumped varies with the tides

We'll let you know in future issues of The Hydrant what the science tells us, but for now *keep conserving!*

Your water, from well to faucet

When water is pumped out of the ground it may or may not host some bacteria, but it will contain organic matter that will allow any bacteria that are present to thrive. It also contains a lot of iron, manganese, and calcium (which makes the water "hard"). In order to kill off any bacteria, when the water is pumped out of the wells, it is immediately dosed with sodium hypochlorite (chlorine). As no one likes the taste of chlorine in their water, we add as little as possible to maintain a state-regulated concentration in the tanks and supply pipes.

One unwanted side effect of adding chlorine to our water is that when it reacts with the bacteria and organic matter it creates substances called Disinfection By-Products (DBPs). Washington state has guidelines for the maximum contaminant level of DBPs (see below) and these DBPs smell and taste unpleasant, so we try to get rid of them. We do this by spraying the water into the top of the holding tanks and use exhaust fans to suck away the off-gassed DBPs. Spraying also reduces the corrosiveness of the water (in fact, this was the original reason for the installation of spray heads). In addition, we recirculate the water in the tanks through the spray nozzles 24/7: The more times the water recirculates, the more DBPs get removed. Finally, the water flows into the distribution lines and into your faucets.

Sometimes the water tastes different, have you noticed? Why is that?

- When demand is high, the water in the tanks has less time to be recirculated before it is replaced with freshly chlorinated water from the wells. Less recirculation means less off-gassing of DBPs and more DBPs at your faucet.
- Occasionally we have a failure of our equipment: The chlorine pump, the recirculation pump or the exhaust fans. The equipment gets checked routinely, so a failure doesn't impact the water for long. It might taste a little different, but it is never unhealthy.

Some of us are more sensitive to chlorine and DBPs than others. A simple carbon filter can make the water taste and smell much better. Rest assured that if you do notice a change in your water, it is still safe to drink. If for any reason it is not safe, you will be notified.

DBP Test Result Update

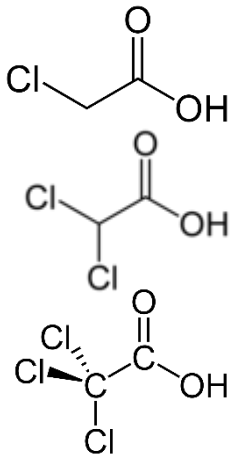
Tests are taken at the end of every calendar quarter. The Maximum Contaminant Level (MCL) of DBPs per Washington State guidelines is 80 mg/L (or 80 parts per million). Unfortunately, our test results are high and are on a slight swing upward.

In 2019 the average was 67.55 mg/L.

In 2020 it was 70.13 mg/L.

In 2021 the average was 87.37 mg/L.

In 2022, two tests have been taken so far. Results were 62.22 mg/L and 111.3 mg/L. The high reading of 111.3 mg/L was attributed to a broken exhaust fan, which has been repaired. While the average thus far is only slightly greater than 80 mg/L, our highest readings are usually in September (because of higher water demand throughout the summer). So our average is probably going to get worse.



HaloAcetic Acids

With all of this said, if you have a concern with the DBPs, 99.9% are removed with a carbon filter. And even easier, if water is set out in a jug, it will slowly aerate and much of the DBPs will dissipate.

Be on the lookout for an email from csj@rockisland.com or capesanjuan@rockisland.com with the latest Consumer Confidence Report Attached.

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